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For: RF PACKAGE

1           1.    A package comprising:  
2                   a substrate including an upper surface ground plane connected to a lower  
3                   surface ground plane by vias through the substrate;  
4                   a die located on the upper ground plane and including a die pad;  
5                   a transmission path including:  
6                           on the upper surface of the substrate, a bonding pad connected to a  
7                           first transmission line itself connected to a transition pad and  
8                                   on the lower surface of the substrate, a second transmission line  
9                                   connected to the transition pad by a via through the substrate;  
10                   a wire bond extending from the bonding pad to the die pad;  
11                   a portion of the upper surface ground plane and the lower surface ground  
12                   plane connected by vias defining opposing walls on either side of the transmission path  
13                   for signal isolation; and  
14                   a low pass filter for compensating wire bond inductance, the filter  
15                   including:  
16                           a first capacitance formed between the bonding pad and at least the  
17                           lower surface ground plane,  
18                                   the wire bond inductance, and  
19                                   a second capacitance formed between the die pad and at least the  
20                           upper surface ground plane.

1                   2.     A package comprising:

2                   a die located on a ground structure;

3                   a transmission path including a bonding pad isolated from the ground

4                   structure;

5                   a die pad on the die;

6                   a wire bond extending between the die pad and the bonding pad; and

7                   a low pass filter for compensating wire bond inductance, the filter

8                   including:

9                   a first capacitance formed between the bonding pad and the ground

10                  structure,

11                  the wire bond inductance, and

12                  a second capacitance formed between the die pad and the ground

13                  structure wherein, for a given frequency requirement and return loss, the first and second

14                  capacitances are tailored to reduce the wire bond inductance.

1                   3.     The package of claim 2 in which the ground structure includes an upper

2                  ground plane connected to a lower ground plane, the die is placed on the upper ground

3                  plane, and the bonding pad is co-planar with the upper ground plane.

1                   4.     The package of claim 3 in which the lower ground plane includes a

2                  portion under the bonding pad.

1           5.     The package of claim 3 in which the ground structure defines opposing  
2     walls on either side of the transmission path.

1           6.     The package of claim 3 further including a substrate between the upper  
2     ground plane and the lower ground plane.

1           7.     The package of claim 6 further including vias through the substrate  
2     interconnecting the upper and lower ground planes.

1           8.     The package of claim 3 in which the bonding pad is connected to a first  
2     transmission line which is connected to a transition pad co-planar with the upper ground  
3     plane and the transition pad is connected to a second transmission line co-planar with the  
4     lower ground plane.

1           9.     A package comprising:

2                 a substrate including an upper surface ground plane connected to a lower

3     surface ground plane by vias through the substrate;

4                 a die located on the upper ground plane and including a die pad;

5                 a transmission path including:

6                     on the upper surface of the substrate, a bonding pad connected to a

7     first transmission line itself connected to a transition pad and,

8                     on the lower surface of the substrate, a second transmission line

9     connected to the transition pad by a via through the substrate;

10                 a wire bond extending from the bonding pad to the die pad; and

11                 a portion of the upper surface ground plane and the lower surface ground

12     plane connected by vias defining opposing walls on either side of the transmission path

13     for signal isolation.

1           10.    The package of claim 9 further including a low pass filter for

2     compensating wire bond inductance, the filter including:

3                 a first capacitance formed between the bonding pad and at least the lower

4     surface ground plane,

5                 the wire bond inductance, and

6                 a second capacitance formed between the die pad and at least the upper

7     surface ground plane.

1           11. The package of claim 9 in which the upper surface ground plane surrounds  
2       the bonding pad, the first transmission line, and the transition pad.

1           12. The package of claim 9 in which the lower surface ground plane and the  
2       second transmission line terminate proximate an edge of the substrate to facilitate  
3       probing.

1           13.    A package comprising:

2                   a substrate including an upper surface ground plane connected to a lower

3                   surface ground plane by vias through the substrate;

4                   a die located on the upper ground plane and including a die pad;

5                   a transmission path including:

6                        on the upper surface of the substrate, a bonding pad connected to a

7                        first transmission line itself connected to a transition pad and,

8                        on the lower surface of the substrate, a second transmission line

9                        connected to the transition pad by a via through the substrate;

10                  a wire bond extending from the bonding pad to the die pad;

11                  a portion of the upper surface ground plane and the lower surface ground

12                  plane connected by vias defining opposing walls on either side of the transmission path

13                  for signal isolation;

14                  the upper surface ground plane surrounding the bonding pad, the first

15                  transmission line, and the transition pad; and

16                  the lower surface ground plane and the second transmission line

17                  terminating proximate an edge of the substrate to facilitate probing.

1           14.    A package comprising:

2                   a substrate including an upper surface ground plane electrically connected

3                   to a lower surface ground plane;

4                   a transmission path including:

5                       on the upper surface of the substrate, a bonding pad electrically

6                   connected to a first transmission line and,

7                       on the lower surface of the substrate, a second transmission line

8                   electrically connected to the first transmission line;

9                       a portion of the upper surface ground plane and the lower surface ground

10                  plane defining structure on either side of the transmission path for signal isolation; and

11                       the upper surface ground plane surrounding the bonding pad and the first

12                  transmission line.

1           15.    A package comprising:

2                   a substrate including an upper surface ground plane electrically connected

3                   to a lower surface ground plane;

4                   a transmission path including:

5                       on the upper surface of the substrate, a bonding pad electrically

6                   connected to a first transmission line and,

7                       on the lower surface of the substrate, a second transmission line

8                   electrically connected to the first transmission line;

9                       a portion of the upper surface ground plane and the lower surface ground

10                  plane defining structure on either side of the transmission path for signal isolation; and

11                  the lower surface ground plane and the second transmission line

12                  terminating proximate an edge of the substrate to facilitate probing.

1           16.    A package comprising:

2                   a substrate including an upper surface ground plane connected to a lower

3                   surface ground plane by vias through the substrate;

4                   a die located on the upper ground plane and including a die pad;

5                   a transmission path including:

6                       on the upper surface of the substrate a bonding pad connected to a

7                       first transmission line itself connected to a transition pad and,

8                       on the lower surface of the substrate a second transmission line

9                       connected to the transition pad by a via through the substrate;

10                  a wire bond extending from the bonding pad to the die pad; and

11                  a low pass filter for compensating wire bond inductance, the filter

12                  including:

13                       a first capacitance formed between the bonding pad and at least the

14                       lower surface ground plane,

15                       the wire bond inductance, and

16                       a second capacitance formed between the die pad and at least the

17                       upper surface ground plane.

1           17.    The package of claim 16 further including a portion of the upper surface

2                   ground plane and the lower surface ground plane connected by vias defining opposing

3                   walls on either side of the transmission path for signal isolation.

1           18. An RF package comprising:

2           a die located on a ground structure;

3           a transmission path including a bonding pad isolated from the ground

4           structure;

5           a die pad on the die;

6           a wire bond extending between the die pad and the bonding pad; and

7           the ground structure including opposing members on either side of the

8           transmission path for signal isolation.

1           19. An interconnect device for use between a bonding pad on a first plane and

2       a die pad on a second plane, the device comprising:

3           at least one wire extending from the bonding pad to the die pad;

4           the bonding pad connected to a transmission line co-planar therewith; and

5           the transmission line connected to a transition pad co-planar therewith.